Case Report | Journal of Orthopaedic Case Reports 2018 September-October : 8(5):Page 19-21

Type III Monteggia Equivalent Lesion with Ipsilateral Fracture Lateral Condyle of Humerus in a Four-year-old Child: A Case Report and Literature Review

Mark Bugeja[1], Arsen Avakyan[1], Eliezer Zahra Bianco[1], Thomas Azzopardi[1]

Learning Point of the Article:

Unstable fractures such as type III Monteggia lesion with ipsilateral fracture of the lateral condyle of humerus in children should be treated early and operatively.

Abstract

Introduction: Monteggia fracture-dislocations are uncommon injuries in children, rarely associated with other ipsilateral upper limb injuries. We present a case of type III Monteggia lesion associated with an ipsilateral fracture of the lateral condyle of the humerus in a child.

Case Report: A 4-year-old girl presented with a left elbow swelling after falling from a height of 2 meters. X-rays showed a fracture of the proximal ulna with lateral dislocation of the radial head (type III Monteggia) associated with an ipsilateral fracture of the lateral condyle of the humerus. The fractures were treated by closed reduction of the radial head dislocation, percutaneous Kirschner wire fixation of the proximal ulna fracture, and open reduction and Kirschner wire fixation of the lateral condyle.

Conclusion: Monteggia fracture-dislocations are challenging both in terms of diagnosis and management and may lead to late disability of the elbow and forearm if not detected early and treated appropriately. Operative management, in this case, gave an excellent result. We recommend operative treatment in these complex elbow fractures.

Keywords: Monteggia fracture-dislocation, lateral condyle fracture, children, Kirschner wires.

Introduction

Monteggia fracture-dislocations are uncommon injuries, accounting for around 2% of all elbow fractures in children [1]. They are challenging both in terms of diagnosis and management and may lead to late disability of the elbow and forearm if not detected early and treated appropriately [2, 3]. In rare cases, the Monteggia fracture-dislocationsare associated with other ipsilateral upper limb injuries in children [1, 3, 4, 5, 6, 7, 8]. We present a case of type III Monteggia lesion associated with an ipsilateral fracture of the lateral condyle of the humerus in a child, an extremely rare combination of injuries [4, 8].

Case Report

A 4-year-old, right-hand dominant girl presents to the accident and emergency department with pain and swelling in the left elbow after falling from a swing. She fell from a height of approximately 2 m, landing on to her left elbow. The patient was supporting the left elbow and forearm with her right hand at presentation. Clinical examination revealed swelling and bruising over the entire left elbow, with tenderness over the left olecranon and lateral epicondyle. Elbow movements were very painful. There was no neurological or vascular compromise of the left upper limb. Radiographic examination of the left elbow region revealed a fracture of the proximal ulna with lateral dislocation of the radial head (type III Monteggia equivalent lesion) associated with an ipsilateral fracture of the lateral condyle of the humerus (Fig. 1). The patient's left elbow was

Access this article online

Website: www.jocr.co.in

DOI: 2250-0685.1190

Author's Photo Gallery


Dr. Mark Bugeja


Dr. Arsen Avakyan


Dr. Eliezer Zahra Bianco


Mr. Thomas Azzopardi

[1]Department of Trauma and Orthopaedics, Mater Dei Hospital, Triq Dun Karm, Msida MSD 2090, Malta.

Address of Correspondence:
Dr. Mark Bugeja,
Department of Trauma and Orthopaedics, Mater Dei Hospital, Triq Dun Karm, Msida MSD 2090, Malta.
E-mail: mark.a.bugeja@gov.mt

Figure 1: Anteroposterior and lateral view radiographs of the left elbow taken on presentation to the accident and emergency department. These radiographs show a fracture of the proximal ulna and lateral dislocation of the radial head, together with a fracture of the lateral humeral condyle.

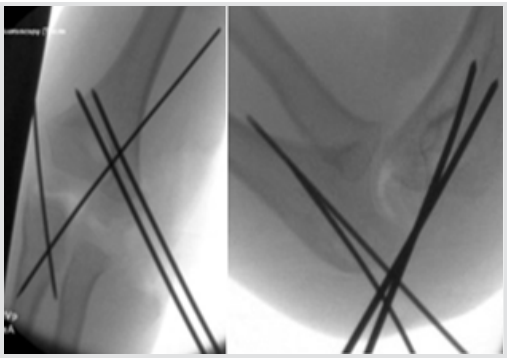

Figure 2: Anteroposterior and lateral view radiographs of the left elbow obtained by intraoperative fluoroscopy.

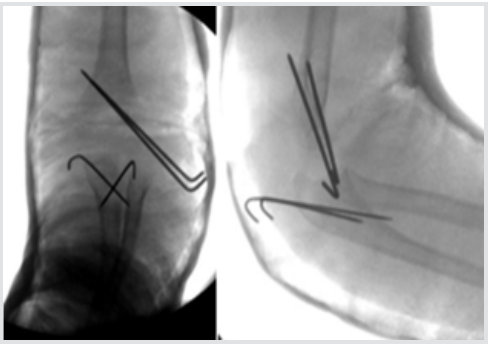

Figure 3: Anteroposterior and lateral view radiographs of the left elbow obtained by intraoperative fluoroscopy, after application of an above elbow cast.

immobilized in an above elbow plaster of Paris back slab. Adequate analgesia was given, and the patient was admitted to hospital. Surgery was performed the following morning under general anesthesia. The patient was placed in the supine position with a pneumatic tourniquet over the left upper arm. Under fluoroscopic control, closed reduction of the radial head and the olecranon was performed. Fixation of the olecranon fracture was achieved using two percutaneous 1.25 mm Kirschner wires. Using the lateral Kocher approach to the left elbow, open reduction of the lateral humeral condyle was performed, and fixation achieved using two percutaneous 1.6 mm Kirschner wires. The radiocapitellar and proximal ulnar alignment and stability were assessed intraoperative under fluoroscopic control (Fig. 2). The surgical wound was closed, and an above elbow plaster of Paris cast was applied with the elbow in 90° of flexion and forearm in neutral position (Fig. 3). Postoperatively, the patient developed swelling and blistering in the left arm at the site of the pneumatic tourniquet due to an adverse reaction of the skin preparation solution and the tourniquet. The cast was split and arm elevated in view of swelling. The patient was discharged on the 2nd day after surgery. The skin changes resolved completely after a week. 3 weeks postoperatively, radiographs were taken (Fig. 4). The Kirschner wires and the plaster cast were removed 5 weeks postoperatively. She was then referred for physical therapy. She achieved a full range of movements in her left elbow and forearm after 3 weeks of starting physical therapy (Fig. 5).

Table 1: Bado classification

Type I	Fracture of the proximal or middle third of the ulna with anterior dislocation of the radial head.
Type II	Fracture of the proximal or middle third of the ulna with posterior dislocation of the radial head.
Type III	Fracture of the ulnar metaphysis with lateral dislocation of the radial head.
Type IV	Fracture of the proximal or middle third of the ulna and radius with dislocation of the radial head in any direction.

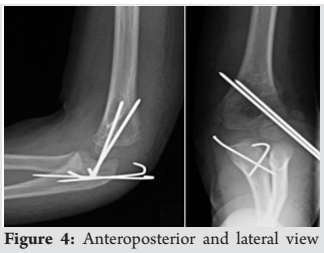

Figure 4: Anteroposterior and lateral view radiographs of the left elbow, at 3 weeks after surgery.

Figure 5: Photographs taken 3 weeks after starting physical therapy, showing the range of movement of the left elbow and forearm compared to the contralateral side.

Discussion

The Monteggia fracture-dislocation was first described by Giovanni Batista Monteggia, an Italian surgeon in his book "Istituzioni Chirugiche," in 1814 [9,10]. Monteggia noted that a fracture of the ulna was associated with a dislocation of the radial head and that they needed to be treated simultaneously [9,10]. This fracture-dislocation type of injury was given its eponym in 1909 by Perrin [9]. In 1967, Jose Luis Bado classified these injuries under the term Monteggia lesion and described several Monteggia variations [9,10]. This classification is comprised four types according to the direction of the radial head dislocation, together with the level and tilt of the proximal ulna fracture (Table 1) [9,10]. Historically, during 1814–1939, the management of the injury by Giovanni Batista Monteggia, using closed reduction and casting resulted in recurrence of radial head dislocation and with suboptimal results [9]. During 1940–1990, with the introduction of implants, antibiotics and advances in anesthesia, open reduction, and internal fixation of the proximal ulna became possible [9]. Except for Monteggia type IV, and difficult cases, Jose Luis Bado recommended non-operative management [9]. In contrast, Speed and Boyd, in their two publications (1940 and 1969), and Bruce et al., in 1974, recommended operative management for adults, and a non-operative management in children [9]. During this period, there was contradictory evidence regarding management of this injury [9]. Nowadays, closed reduction of the radial head, and open reduction with internal fixation of the proximal ulnar fracture, is the recognized management for Monteggia injury in adults [9]. In children, however, operative management is reserved for complex

elbow injuries [9]. To the best of our knowledge, only two cases of type III Monteggia lesion with fracture of the lateral condyle were reported in literature. Dattani et al. reported a case involving a 3-year-old boy who underwent closed reduction of the radial head under general anesthesia, with the elbow immobilized for 4 weeks [4]. At 6 months, this boy achieved full range of movement at elbow, forearm, and wrist [4]. Park and Suh reported a similar injury in a 5-year-old girl, associated with radial nerve injury [8]. This was managed by open reduction and Kirschner wire fixation of lateral condyle fracture and a transcapitellar Kirschner wire fixation of radial head dislocation [8]. The ulna, however, was not fixed. We describe an operative management for these injuries, having a different technique than that described by Park and Suh [8]. The outcome of operative management in both cases was excellent. Dattani et al. had good functional results with non-operative management [4]. However, we recommend surgical management for this unstable combination of injuries, using percutaneous Kirschner wires to reduce the risk of further displacement and thus late disability.

Conclusion

Type III Monteggia lesions with ipsilateral fracture of the lateral condyle of the humerus in children are an exceptionally rare elbow injury. Early detection and the appropriate management are essential to avoid late disability of the elbow and forearm. This case highlights the importance of excluding other associated injuries when one elbow fracture is detected, as these are otherwise easily missed and overlooked. We strongly recommend surgical management in these types of elbow fractures.

Clinical Message

Type III Monteggia lesion with ipsilateral fracture of the lateral condyle of the humerus is an exceptionally rare elbow injury in children. For this unstable injury, we strongly recommend early detection followed by surgical management.

References

1. Song KS, Bae KC. Type III monteggia equivalent fracture with ipsilateral distal radial epiphyseal and ulnar metaphyseal fracture in a child. J Korean Orthop Assoc 2004;39:563-5.
2. Gundavda MK, Chinoy RK. A case of an unusual Monteggia equivalent Type II with lateral condyle fracture. J Orthop 2015;12:260-3.
3. Williams HL, Madhusudhan TR, Sinha A. Type III monteggia injury with ipsilateral type II salter harris injury of the distal radius and ulna in a child: A case report. BMC Res Notes 2014;7:156.
4. Dattani R, Patnaik S, Kantak A, Lal M. Distal humerus lateral condyle fracture and monteggia lesion in a 3-year old child: A case report. Acta Orthop Belg 2008;74:542-5.
5. Kapil Mani KC, Sigdel A, Rayamajhi AJ. A rare combination injury of Type III monteggia fracture dislocation and ipsilateral epiphyseal fracture of distal radius in children. Is there a probability of missing the monteggia component? Chin J Traumatol 2015;18:51-3.
6. Kara A, Kayaalp ME, Isyar M, Sever C, Malkoc M, Mahir M, et al. An undescribed monteggia Type 3 equivalent lesion: lateral dislocation of radial head with both-bone forearm fracture. Case Rep Orthop 2016;2016:8598139.
7. Sinha S, Chang W, Campbell A, Sinha SS, Hussein S. Type III monteggia injury with ipsilateral distal radius and ulna fracture. Internet J Orthop Surg 2002;Volume 1 Number 2.
8. Park JH, Suh SW. Ipsilateral monteggia fracture and lateral condyle fracture of humerus in children. J Korean Soc Fract 1997;10:708.
9. Rehim SA, Maynard MA, Sebastin SJ, Chung KC. Monteggia fracture dislocations: A historical review. J Hand Surg Am 2014;39:1384-94.
10. Wiley JJ, Galey JP. Monteggia injuries in children. J Bone Joint Surg Br 1985;67:728-31.

Conflict of Interest: Nil
Source of Support: Nil

Consent: The authors confirm that Informed consent of the patient is taken for publication of this case report

How to Cite this Article

Bugeja M, Avakyan A, Bianco E Z, Azzopardi T. Type III Monteggia Equivalent Lesion with Ipsilateral Fracture Lateral Condyle of Humerus in a Four-year-old Child: A Case Report and Literature Review. Journal of Orthopaedic Case Reports 2018 Sep-Oct; 8(5): 19-21